INTERNATIONAL STANDARD

ISO/IEC 21838-3

First edition
2023-09

Information technology — Top-level ontologies (TLO) —

Part 3: Descriptive ontology for linguistic and cognitive engineering (DOLCE)

Reference number
ISO/IEC 21838-3:2023(E)

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Published in Switzerland

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Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

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Introduction

The descriptive ontology for linguistic and cognitive engineering (DOLCE) (see References [1] and [3]) is a top-level ontology (TLO) conforming to ISO/IEC 21838-1:2021. It contains definitions of its terms and relational expressions and formal representations in OWL 2 and in Common Logic (CL).

DOLCE is a top-level ontology aimed at making people's assumptions about the nature and structure of the world explicit, as reflected by natural language, cognition and human common sense (see its backbone taxonomy in Figure 1). DOLCE is widely used by a diverse array of domain ontologies in areas like enterprise and process modeling, engineering, robotics, geographical information systems, socio-technical systems and digital humanities.

The natural language specification of the DOLCE signature supports human maintenance and use of the ontology, including use in development of conformant domain ontologies.

The adoption of the Web Ontology Language (OWL) as a W3C standard was motivated by the need to have a decidable ontology representation language as the basis for the Semantic Web. The OWL 2 formalization of DOLCE supports use of the ontology in computing, including enabling DOLCE to be used in tandem with other ontologies expressed in OWL and in related languages, and in allowing ontology quality control through use of OWL reasoners.

The CL formalization of DOLCE provides the expressivity needed to provide an axiomatization whose models are the intended models of DOLCE. This axiomatization has a modular structure (see Figure 2 where the arrows represent the relation of extension of theories).

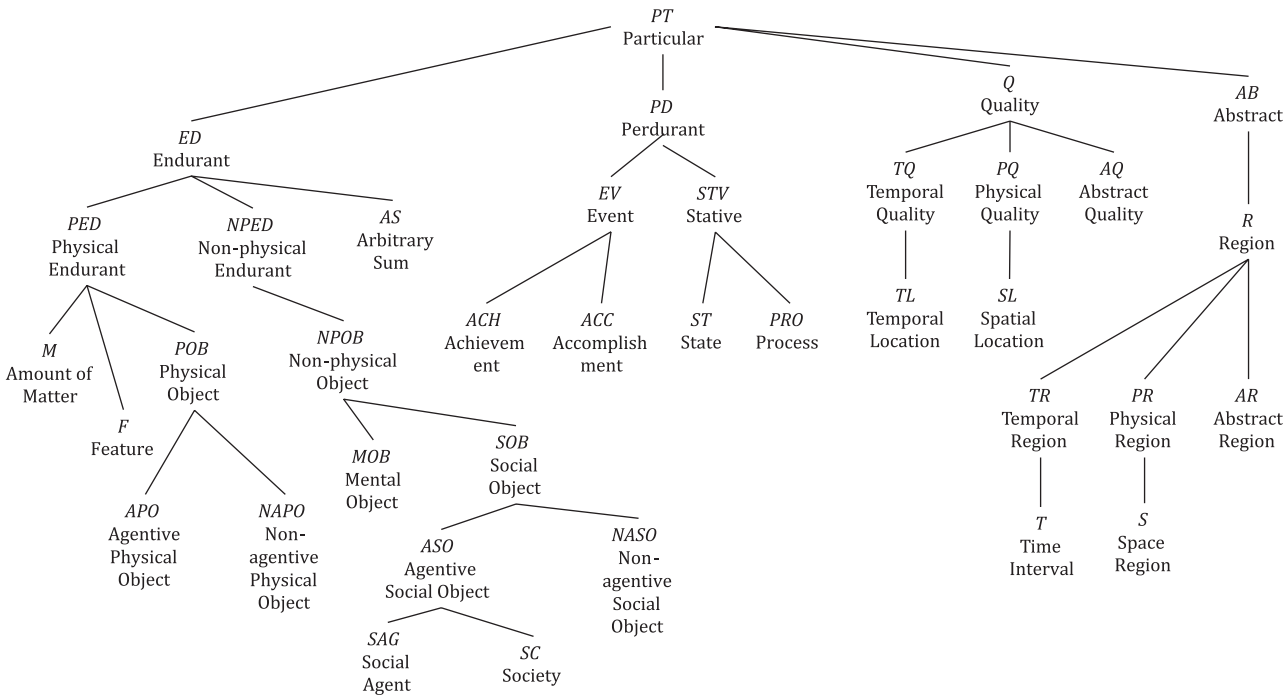


Figure 1 — DOLCE taxonomy

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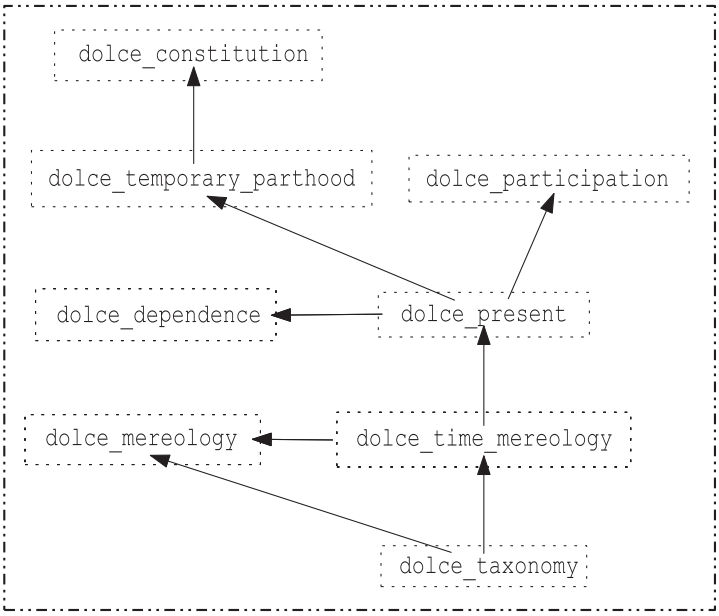


Figure 2 — DOLCE modules

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Information technology — Top-level ontologies (TLO) —

Part 3:
Descriptive ontology for linguistic and cognitive engineering (DOLCE)

1 Scope

This document describes descriptive ontology for finguistic and cognitive engineering (DOLCE) as an ontology that is conformant to the requirements specified for top-level ontologies in ISO/IEC 21838-1.

This document describes DOLCE as a resource designed to support ontology design, ontology integration, and semantic integration of heterogeneous information systems.

The following are within the scope of this document:

— definitions of classes and relations in the signature of DOLCE;

— axiomatizations of DOLCE in OWL 2 and CL;

— documentation of the conformity of DOLCE to the requirements specified for top-level ontologies in ISO/IEC 21838-1;

— documentation of the methodology for specifying domain ontologies that conform to DOLCE.

The following are outside the scope of this document:

— specification of ontology languages, including the languages RDF, OWL, and CL standardly used in ontology development;

— specification of methods for reasoning with ontologies;

— specification of translators between the notations of ontologies developed in different ontology languages.

2 Normative references

The following documents are referred to in the text in such a way that their content constitutes requirements of this document. The latest edition of the referenced documents (including any amendments) applies.

ISO/IEC 21838-1:2021, *Information technology — Top-level ontologies (TLO) — Part 1: Requirements*

ISO/IEC 24707, *Information technology — Common Logic (CL) — A framework for a family of logic-based languages*

3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO/IEC 21838-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

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